

consisting of sucrose, lactose, maltose and trehalose, or a derivative thereof; an oligosaccharide selected from the group consisting of malt triose, maltosyl cyclodextrin, α -cyclodextrin, β -cyclodextrin and γ -cyclodextrin, or a derivative thereof; a polysaccharide selected from the group consisting of dextrin, amylose, glycogen, inulin and Ficoll, or a derivative thereof.

IN THE CLAIMS:

Please add the following new claims:

-- 21. (New) A method for stabilizing glucose dehydrogenase for use in glucose sensors, wherein at least one additive is added to glucose dehydrogenase whose coenzyme is pyrrolo-quinoline quinone, said additive being selected from the group consisting of phthalic acid, a phthalate, maleic acid, a maleate, triethanol amine, a triethanol amine salt, citric acid, a citrate, dimethyl glutamic acid, 2-(N-morpholino)ethane sulfonic acid, a 2-(N-morpholino)ethane sulfonate, tris(hydroxymethyl)glycine, a tris(hydroxymethyl)glycine salt, tris(hydroxymethyl)aminomethane, a tris(hydroxymethyl)aminomethane salt, imidazole or colicin.

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~~22.~~ (New) A method for stabilizing glucose dehydrogenase for use in glucose sensors, wherein phthalic acid or a phthalate is added to glucose-dehydrogenase whose coenzyme is pyrrolo-quinoline quinone.

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~~23.~~ (New) The method for stabilizing glucose dehydrogenase for use in glucose sensors in accordance with claim ¹⁸~~22~~, wherein a stabilizer is added to glucose dehydrogenase whose coenzyme is pyrrolo-quinoline quinone, said stabilizer having a function of retaining the activity of enzyme and the long-term preservation of said sensor and decreasing the blank value of said sensor.

²⁰~~23~~ (New) The method for stabilizing glucose dehydrogenase for use in glucose sensors in accordance with claim ¹⁹~~23~~, wherein said stabilizer is a metal salt, an organic acid, a protein, an amino acid, a sugar or a derivative thereof, a surfactant, or ammonium sulfate.

²¹~~28~~ (New) The method for stabilizing glucose dehydrogenase for use in glucose sensors in accordance with claim ²⁰~~24~~, wherein said stabilizer is a metal salt selected from the group consisting of a calcium salt, a strontium salt and a manganese salt.

²²~~26~~ (New) The method for stabilizing glucose dehydrogenase for use in glucose sensors in accordance with claim ²¹~~25~~, wherein said metal salt is a sulfate, a nitrate or a halide.

²³~~27~~ (New) The method for stabilizing glucose dehydrogenase for use in glucose sensors in accordance with claim ²¹~~25~~, wherein said calcium salt is CaCl_2 .

²⁴~~28~~ (New) The method for stabilizing glucose dehydrogenase for use in glucose sensors in accordance with claim ²⁰~~24~~, wherein said stabilizer is an organic acid selected from the group consisting of α -ketoglutaric acid, malic acid, fumaric acid, gluconic acid, cholic acid and deoxycholic acid.

²⁵~~29~~ (New) The method for stabilizing glucose dehydrogenase for use in glucose sensors in accordance with claim ²⁰~~24~~, wherein said stabilizer is a protein selected from the group consisting of bovine serum albumin, egg albumin and gelatin.

²⁶~~30~~ (New) The method for stabilizing glucose dehydrogenase for use in glucose sensors in accordance with claim ²⁰~~24~~, wherein said stabilizer is a sugar or a derivative thereof selected from the group consisting of a monosaccharide and a derivative thereof, a disaccharide and a derivative thereof, an oligosaccharide and a derivative thereof, and a polysaccharide and a derivative thereof.

²⁷
~~27~~ (New) The method for stabilizing glucose dehydrogenase for use in glucose sensors in accordance with claim ~~20~~²⁶, wherein said stabilizer is a monosaccharide selected from the group consisting of glucose, fructose, galactose, mannose, xylose, inositol, monnitol, sorbitol, ribitol, glucosamine and deoxyglucose, or a derivative thereof.

²⁸
~~32~~ (New) The method for stabilizing glucose dehydrogenase for use in glucose sensors in accordance with claim ~~20~~²⁶, wherein said stabilizer is a disaccharide selected from the group consisting of sucrose, lactose, maltose and trehalose, or a derivative thereof.

²⁹
~~33~~ (New) The method for stabilizing glucose dehydrogenase for use in glucose sensors in accordance with claim ~~20~~²⁶, wherein said stabilizer is an oligosaccharide selected from the group consisting of malt triose, maltosyl cyclodextrin, α -cyclodextrin, β -cyclodextrin and γ -cyclodextrin, or a derivative thereof.

³⁰
~~34~~ (New) The method for stabilizing glucose dehydrogenase for use in glucose sensors in accordance with claim ~~20~~²⁶, wherein said stabilizer is a polysaccharide selected from the group consisting of dextrin, amylose, glycogen, inulin and Ficoll, or a derivative thereof.

³¹
~~35~~ (New) The method for stabilizing glucose dehydrogenase for use in glucose sensors in accordance with claim ~~24~~²⁰, wherein said stabilizer is an amino acid selected from the group consisting of lysine, histidine, glutamic acid, glycylglycine and polylysine.

³²
~~36~~ (New) The method for stabilizing glucose dehydrogenase for use in glucose sensors in accordance with claim ~~24~~²⁰, wherein said stabilizer is a non-ionic surfactant.

³³
~~37~~ (New) The method for stabilizing glucose dehydrogenase for use in glucose sensors in accordance with any of claim ~~22~~¹⁸ to ~~36~~³², wherein said reaction layer further contains maleic acid, a maleate, succinic acid, a succinate, triethanol amine, a triethanol amine salt, citric

acid, a citrate, dimethyl glutaric acid, 2-(N-morpholino)ethane sulfonic acid, a 2-(N-morpholino)ethane sulfonate, tris(hydroxymethyl)glycine, a tris(hydroxymethyl)glycine salt, tris(hydroxymethyl)aminomethane, a tris(hydroxymethyl)aminomethane salt, imidazole or colicin.

38. (New) A glucose dehydrogenase composition for use in glucose sensors, said composition containing glucose dehydrogenase whose coenzyme is pyrrolo-quinoline quinone, and at least one additive selected from the group consisting of phthalic acid, a phthalate, maleic acid, a maleate, triethanol amine, a triethanol amine salt, citric acid, a citrate, dimethyl glutaric acid, (N-morpholino)ethane sulfonic acid, a 2-(N-morpholino)ethane sulfonate tris(hydroxymethyl)glycine, a tris(hydroxymethyl)glycine salt, tris(hydroxymethyl)aminomethane, a tris(hydroxymethyl)aminomethane salt, imidazole or colicin.

39. (New) A glucose dehydrogenase composition for use in glucose sensors, said composition containing glucose dehydrogenase whose coenzyme is pyrrolo-quinoline quinone, and phthalic acid or a phthalate.

40. (New) The glucose dehydrogenase composition for use in glucose sensors in accordance with claim 39, said composition further containing a stabilizer, said stabilizer having a function of retaining the activity of the enzyme and the long-term preservation of said sensor and decreasing the blank value of said sensor.

41. (New) The glucose dehydrogenase composition for use in glucose sensors in accordance with claim 40, wherein said stabilizer is a metal salt, an organic acid, a protein, an amino acid, a sugar or a derivative thereof, a surfactant, or ammonium sulfate.

~~37~~ ³⁸ ~~42~~ (New) The glucose dehydrogenase composition for use in glucose sensors in accordance with claim ~~41~~ ³⁷, wherein said stabilizer is a metal salt selected from the group consisting of a calcium salt, a strontium salt and a manganese salt.

~~39~~ ³⁹ ~~42~~ (New) The glucose dehydrogenase composition for use in glucose sensors in accordance with claim ~~42~~ ³⁸, wherein said metal salt is a sulfate, a nitrate or a halide.

~~40~~ ⁴⁰ ~~44~~ (New) The glucose dehydrogenase composition for use in glucose sensors in accordance with claim ~~42~~ ³⁸, wherein said calcium salt is CaCl_2 .

~~41~~ ⁴¹ ~~45~~ (New) The glucose dehydrogenase composition for use in glucose sensors in accordance with claim ~~41~~ ³⁷, wherein said stabilizer is an organic acid selected from the group consisting of a α -ketoglutaric acid, malic acid, fumaric acid, gluconic acid, cholic acid and deoxycholic acid.

~~42~~ ⁴² ~~46~~ (New) The glucose dehydrogenase composition for use in glucose sensors in accordance with claim ~~41~~ ³⁷, wherein said stabilizer is a protein selected from the group consisting of bovine serum albumin, egg albumin and gelatin.

~~43~~ ⁴³ ~~47~~ (New) The glucose dehydrogenase composition for use in glucose sensors in accordance with claim ~~41~~ ³⁷, wherein said stabilizer is a sugar or a derivative thereof selected from the group consisting of a monosaccharide and a derivative thereof, a disaccharide and a derivative thereof, an oligosaccharide and a derivative thereof, and a polysaccharide and a derivative thereof.

~~44~~ ⁴⁴ ~~48~~ (New) The glucose dehydrogenase composition for use in glucose sensors in accordance with claim ~~47~~ ⁴³, wherein said stabilizer is a monosaccharide selected from the group

consisting of glucose, fructose, galactose, mannose, xylose, inositol, monnitol, sorbitol, ribitol, glucosamine and deoxyglucose, or a derivative thereof.

~~44~~ 45

49. (New) The glucose dehydrogenase composition for use in glucose sensors in accordance with claim ~~47~~ ⁴³, wherein said stabilizer is a disaccharide selected from the group consisting of sucrose, lactose, maltose and trehalose, or a derivative thereof.

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50. (New) The glucose dehydrogenase composition for use in glucose sensors in accordance with claim ~~47~~ ⁴³, wherein said stabilizer is an oligosaccharide selected from the group consisting of malt triose, maltosyl cyclodextrin, α -cyclodextrin, β -cyclodextrin and γ -cyclodextrin, or a derivative thereof.

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51. (New) The glucose dehydrogenase composition for use in glucose sensors in accordance with claim ~~47~~ ⁴³, wherein said stabilizer is a polysaccharide selected from the group consisting of dextrin, amylose, glycogen, inulin and Ficoll, or a derivative thereof.

~~47~~ 48

52. (New) The glucose dehydrogenase composition for use in glucose sensors in accordance with claim ~~41~~ ³⁷, said stabilizer is an amino acid selected from the group consisting of lysine, histidine, glutamic acid, glycylglycine and polylysine.

~~48~~ 49

53. (New) The glucose dehydrogenase composition for use in glucose sensors in accordance with claim ~~41~~ ³⁷, wherein said stabilizer is a non-ionic surfactant.

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54. (New) The glucose dehydrogenase composition for use in glucose sensors in accordance with any of claims ~~29~~ ³⁵ to ~~53~~ ⁴⁹, wherein said reaction layer further contains maleic acid, a maleate, succinic acid, a succinate, triethanol amine, a triethanol amine salt, citric acid, a citrate, dimethyl glutaric acid, 2-(N-morpholino)ethane sulfonic acid, a 2-(N-morpholino)ethane sulfonate, tris(hydroxymethyl)glycine, a tris(hydroxymethyl)glycine salt,

tris(hydroxymethyl)aminomethane, a tris(hydroxymethyl)aminomethane salt, imidazole or colicin.

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(New) A glucose sensor comprising an electrically insulating base plate, an electrode system including at least a working electrode and a counter electrode formed on said base plate, and a reaction layer which is formed in contact with or in the vicinity of said electrode system wherein said reaction layer contains: at least one stabilizer selected from the group consisting of a metal salt, an organic acid, a protein, and a sugar and a derivative thereof; a glucose dehydrogenase whose coenzyme is pyrrolo-quinoline quinone; and a buffer selected from the group consisting of maleic acid, a maleate, triethanol amine, a triethanol amine salt, ~~citric acid, a citrate~~, dimethyl glutaric acid, 2-(N-morpholino)ethane sulfonic acid, a 2-(N-morpholino)ethane sulfonate, tris(hydroxymethyl)glycine, a tris(hydroxymethyl)glycine salt, tris(hydroxymethyl)aminomethane, a tris(hydroxymethyl)aminomethane salt, imidazole or colicin.

~~51~~ 52

(New) The glucose sensor in accordance with claim ~~50~~, wherein said stabilizer is a metal salt selected from the group consisting of a calcium salt, CaC_2 , a strontium salt and a manganese salt.

~~52~~ 53

(New) The glucose sensor in accordance with claim ~~51~~, wherein said stabilizer is an organic acid selected from the group consisting of α -ketoglutaric acid, malic acid, fumaric acid, gluconic acid, cholic acid and deoxycholic acid.

~~53~~ 54

(New) The glucose sensor in accordance with claim ~~53~~, wherein said stabilizer is a protein selected from the group consisting of bovine serum albumin, egg albumin and gelatin.

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~~55~~ 55 (New) The glucose sensor in accordance with claim ~~55~~ 55, wherein said stabilizer is a sugar or a derivative thereof selected from the group consisting of a monosaccharide and a derivative thereof, a disaccharide, and a derivative thereof, an oligosaccharide and a derivative thereof, and a polysaccharide and a derivative thereof.

~~56~~ 56 (New) The glucose sensor in accordance with claim ~~55~~ 55, wherein said stabilizer is a monosaccharide selected from the group consisting of glucose, fructose, galactose, mannose, xylose, inositol, monnitol, sorbitol, ribitol, glucosamine and deoxyglucose, or a derivative thereof.

~~57~~ 57 (New) The glucose sensor in accordance with claim ~~55~~ 55, wherein said stabilizer is a disaccharide selected from the group consisting of sucrose, lactose, maltose and trehalose, or a derivative thereof.

~~58~~ 58 (New) The glucose sensor in accordance with claim ~~55~~ 55, wherein said stabilizer is an oligosaccharide selected from the group consisting of malt triose, maltosyl cyclodextrin, α -cyclodextrin, β -cyclodextrin and γ -cyclodextrin, or a derivative thereof.

~~59~~ 59 (New) The glucose sensor in accordance with claim ~~55~~ 55, wherein said stabilizer is a polysaccharide selected from the group consisting of dextrin, amylose, glycogen, inulin and Ficoll, or a derivative thereof.

64. (New) A method for stabilizing glucose dehydrogenase for use in glucose sensors, wherein a stabilizer and a buffer are added to glucose dehydrogenase whose coenzyme is pyrrolo-quinoline quinone,

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said stabilizer being selected from the group consisting of a metal salt, an organic acid, a protein, and a sugar and a derivative thereof, and said buffer being selected from the group consisting of maleic acid, a maleate, triethanol amine, a triethanol amine salt, citric acid, a citrate, dimethyl glutaric acid, 2-(N-morpholino)ethane sulfonic acid, a 2-(N-morpholino)ethane sulfonate, tris(hydroxymethyl)glycine, a tris(hydroxymethyl)glycine salt, tris(hydroxymethyl)aminomethane, a tris(hydroxymethyl)aminomethane salt, imidazole or colicin.

~~65~~ (New) The method for stabilizing glucose dehydrogenase for use in glucose sensors in accordance with claim ~~64~~, wherein said stabilizer is a metal salt selected from the group consisting of a calcium salt, CaCl_2 , a strontium salt and a manganese salt.

~~66~~ (New) The method for stabilizing glucose dehydrogenase for use in glucose sensors in accordance with claim ~~64~~, wherein said stabilizer is an organic acid selected from the group consisting of α -ketoglutaric acid, malic acid, fumaric acid, gluconic acid, cholic acid and deoxycholic acid.

~~67~~ (New) The method for stabilizing glucose dehydrogenase for use in glucose sensors in accordance with claim ~~64~~, wherein said stabilizer is a protein selected from the group consisting of bovine serum albumin, egg albumin and gelatin.

~~68~~ (New) The method for stabilizing glucose dehydrogenase for use in glucose sensors in accordance with claim ~~64~~, wherein said stabilizer is a sugar or a derivative thereof selected from the group consisting of a monosaccharide and a derivative thereof, a disaccharide and a derivative thereof, an oligosaccharide and a derivative thereof, and a polysaccharide and a derivative thereof.

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63 64
65 66 (New) The method for stabilizing glucose dehydrogenase for use in glucose sensors in accordance with claim 63, wherein said stabilizer is a monosaccharide selected from the group consisting of glucose, fructose, galactose, mannose, xylose, inositol, monnitol, sorbitol, ribitol, glucosamine and deoxyglucose, or a derivative thereof.

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70. (New) The method for stabilizing glucose dehydrogenase for use in glucose sensors in accordance with claim 63, wherein said stabilizer is a disaccharide selected from the group consisting of sucrose, lactose, maltose and trehalose, or a derivative thereof.

65 67
71. (New) The method for stabilizing glucose dehydrogenase for use in glucose sensors in accordance with claim 63, wherein said stabilizer is an oligosaccharide selected from the group consisting of malt triose, maltosyl cyclodextrin, α -cyclodextrin, β -cyclodextrin and γ -cyclodextrin, or a derivative thereof.

67 68
72. (New) The method for stabilizing glucose dehydrogenase for use in glucose sensors in accordance with claim 63, wherein said stabilizer is a polysaccharide selected from the group consisting of dextrin, amylose, glycogen, inulin and Ficoll, or a derivative thereof.

73. (New) A glucose dehydrogenase composition for use in glucose sensors, said composition containing: at least one stabilizer selected from the group consisting of a metal salt, an organic acid, a protein, and a sugar and a derivative thereof; a glucose dehydrogenase whose coenzyme is pyrrolo-quinoline quinone; and a buffer selected from the group consisting of maleic acid, a maleate, triethanol amine, a triethanol amine salt, citric acid, a citrate, dimethyl glutaric acid, 2-(N-morpholino)ethane sulfonic acid, a 2-(N-morpholino)ethane sulfonate, tris(hydroxymethyl)glycine, a tris(hydroxymethyl)glycine salt,

tris(hydroxymethyl)aminomethane. a tris(hydroxymethyl)aminomethane salt, imidazole or colicin.

~~69/74~~ ^{68/69} 70 (New) The glucose dehydrogenase composition for use in glucose sensors in accordance with claim ~~75~~, wherein said stabilizer is a metal salt selected from the group consisting of a calcium salt, CaCl_2 , a strontium salt and a manganese salt.

~~70/71~~ ^{68/69} 71 (New) The glucose dehydrogenase composition for use in glucose sensors in accordance with claim ~~75~~, wherein said stabilizer is an organic acid selected from the group consisting of α -ketoglutaric acid, malic acid, fumaric acid, gluconic acid, cholic acid and deoxycholic acid.

~~71/72~~ ^{68/69} 72 (New) The glucose dehydrogenase composition for use in glucose sensors in accordance with claim ~~75~~, wherein said stabilizer is a protein selected from the group consisting of bovine serum albumin, egg albumin and gelatin.

~~72/73~~ ^{68/69} 73 (New) The glucose dehydrogenase composition for use in glucose sensors in accordance with claim ~~75~~, wherein said stabilizer is a sugar or a derivative thereof selected from the group consisting of a monosaccharide and a derivative thereof, a disaccharide and a derivative thereof, an oligosaccharide and a derivative thereof, and a polysaccharide and a derivative thereof.

~~73/74~~ ^{68/69} ~~74/75~~ ^{75/73} 74 (New) The glucose dehydrogenase composition for use in glucose sensors in accordance with claim ~~77~~, wherein said stabilizer is a monosaccharide selected from the group consisting of glucose, fructose, galactose, mannose, xylose, inositol, monnitol, sorbitol, ribitol, glucosamine and deoxyglucose, or a derivative thereof.